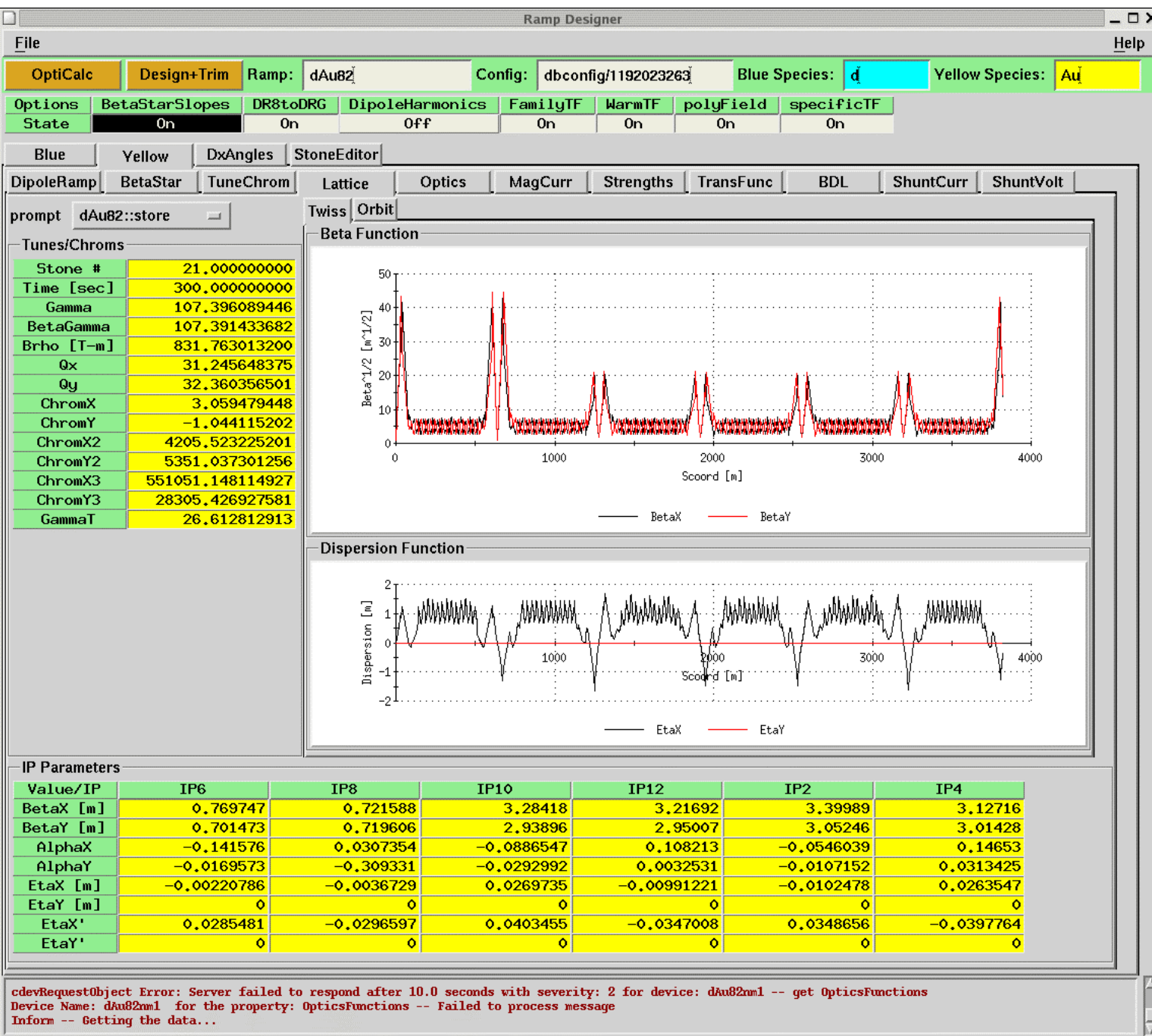


# Beta-waist knobs

Al, Mei, Nikolay, Todd, Vadim



IR8 knob:

$$\Delta\alpha_y = -0.3$$

$$\alpha(0) = s^*/\beta^*$$

OptiCalc Design+Trim Ramp: dAu82 Config: dbconfig/1192023263 Blue Species: d Yellow Species: Au

Options BetaStarSlopes DR8toDRG DipoleHarmonics FamilyTF WarmTF polyField specificTF  
State On On Off On On On On

Blue Yellow DxAngles StoneEditor

DipoleRamp BetaStar TuneChrom Lattice Optics MagCurr Strengths TransFunc BDL ShuntCurr ShuntVolt

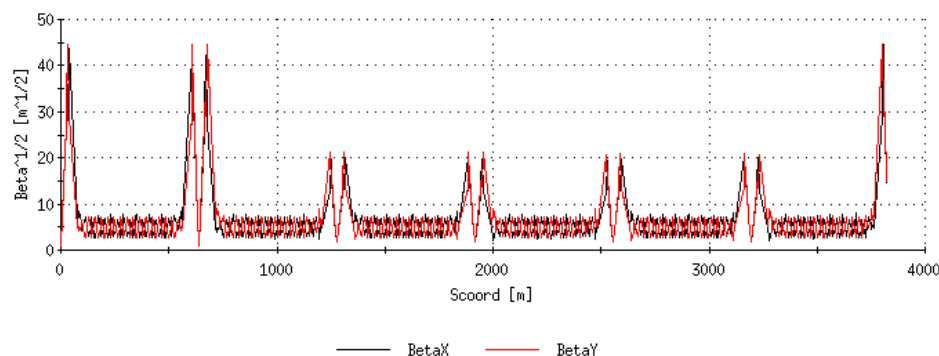
prompt dAu82::store

Tunes/Chroms

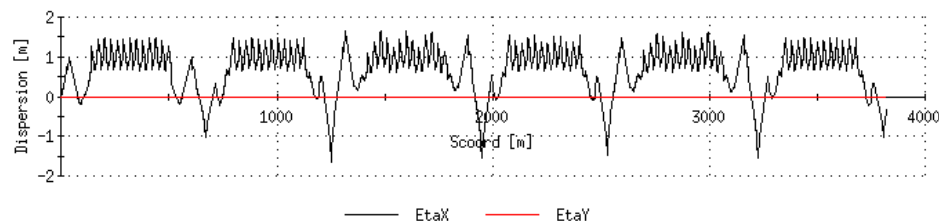
Stone #	21.000000000
Time [sec]	300.000000000
Gamma	107.396089446
BetaGamma	107.391433682
Brho [T-m]	831.763013200
Qx	31.244508129
Qy	32.364294345
ChromX	0.144256211
ChromY	-0.361146619
ChromX2	4502.883044414
ChromY2	5826.354915532
ChromX3	550305.511881219
ChromY3	13333.647927920
GammaT	26.623932369

Twiss Orbit

Beta Function



Dispersion Function



IP Parameters

Value/IP	IP6	IP8	IP10	IP12	IP2	IP4
BetaX [m]	0.715412	0.744191	3.37709	3.43374	3.47738	3.32402
BetaY [m]	0.712343	0.725248	2.92591	2.92508	3.08408	3.03904
AlphaX	0.253775	0.0942925	-0.153284	0.124926	-0.115741	0.160833
AlphaY	0.286331	-0.318	-0.0206343	0.00855573	-0.0104879	0.0383305
EtaX [m]	-0.0132757	-0.00610169	0.0138025	-0.000120351	0.00219272	0.0153767
EtaY [m]	0	0	0	0	0	0
EtaX'	0.0221715	-0.0218078	0.0400543	-0.0374091	0.0355024	-0.0373244
EtaY'	0	0	0	0	0	0

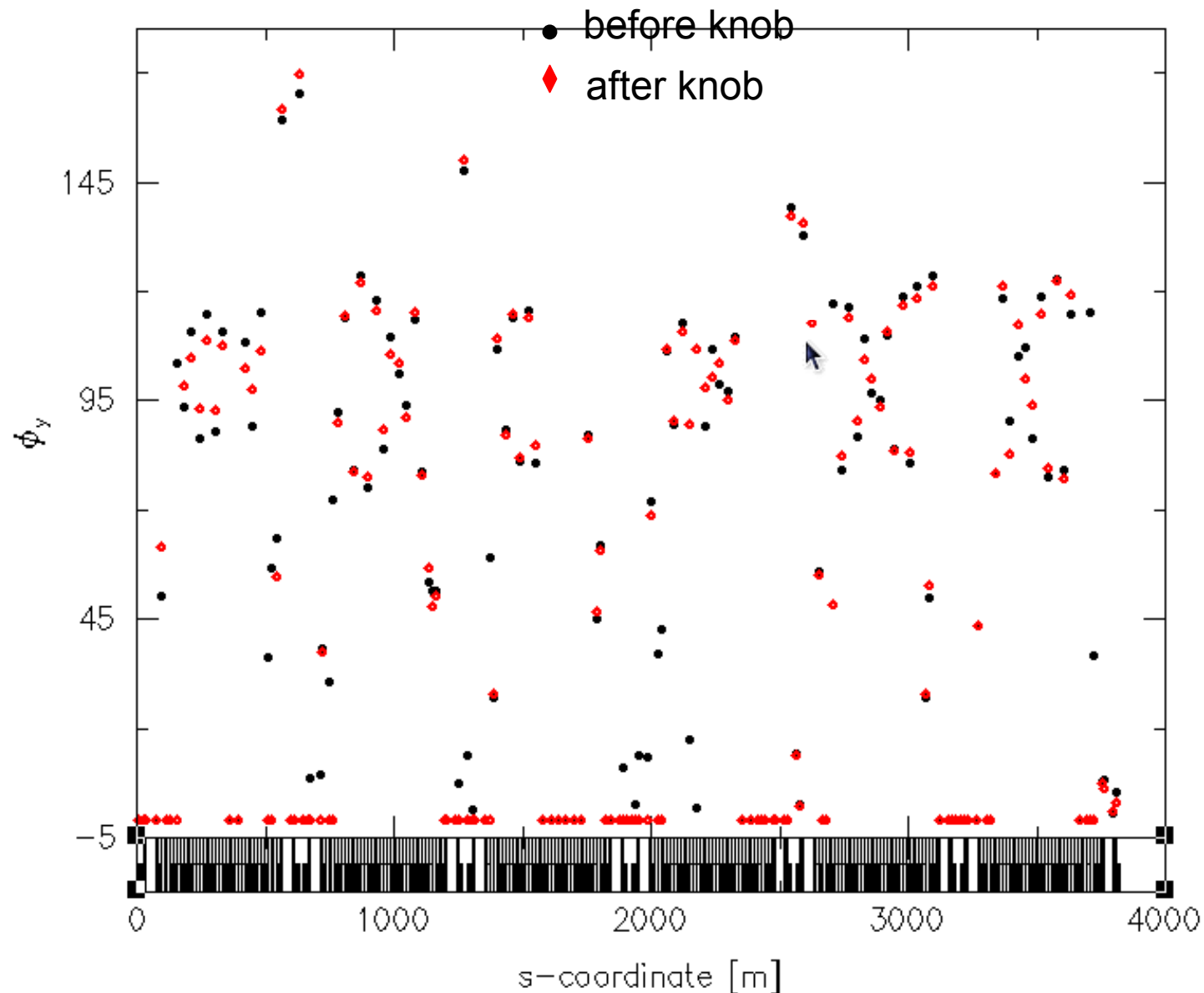
IR6 knob:

$$\Delta\alpha_x = 0.3$$

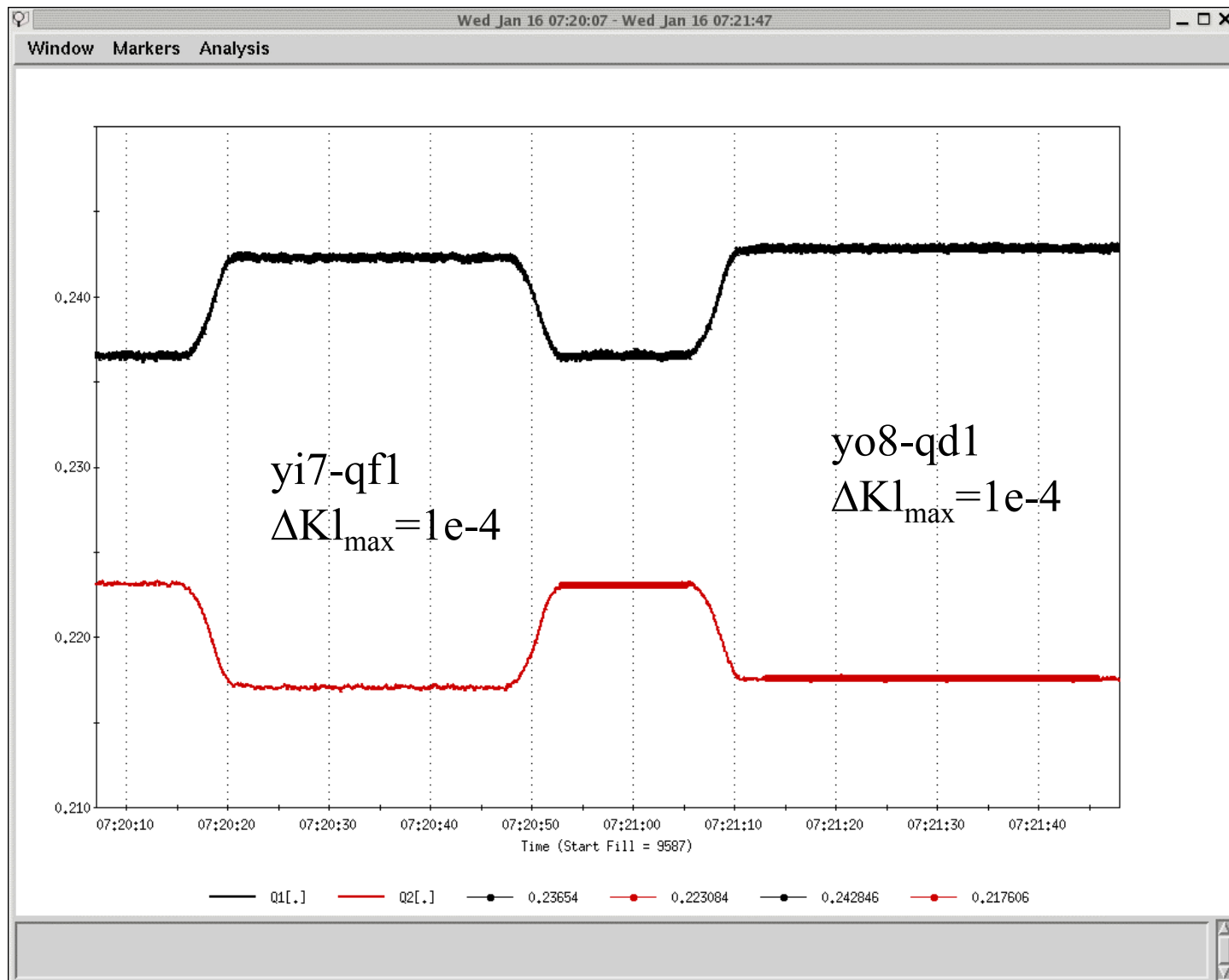
$$\Delta\alpha_y = 0.3$$

cdevRequestObject Error: Server failed to respond after 10.0 seconds with severity: 2 for device: dAu82nm1 -- get OpticsFunctions  
Device Name: dAu82nm1 for the property: OpticsFunctions -- Failed to process message  
Inform -- Getting the data...

Optics comparisons before and after the application of IR8 Knob, as measured by the AC dipole.



# Example of Yellow tune changes during Q1 gradient variations



# The results from the gradient variation measurements

	Yellow			
	IR6 H	IR6 V	IR8 H	IR8 V
$\beta^*, \text{m}$ 2 weeks ago	0.80	0.88	0.85	0.89
before the knob	0.80	0.91	0.90	0.94
after the knob	0.76	0.96	0.86	0.88
$s^*, \text{cm}$ 2 weeks ago	-34	-33	2	30
before the knob	-29	-53	-8	15
after the knob	13	-29	-9	-5
expected $\Delta s^*$	24	27	0	-28
measured $\Delta s^*$	42	24	-1	-20

## AC Dipole Measurements for IR8 knob

IR8 knob:

$$\Delta\alpha_y = -0.3$$

- Yellow beta\* and waist at IP8 before Nikolay applied his knob
  - V beta\*: 1.03+-0.02@-0.18
- Yellow beta\* and waist at IP8 after Nikolay applied his knob
  - V beta\*: 0.83+-0.02@0.04
- working point was also changed:
  - before: Qx=0.2297, Qy=0.2336
  - after: Qx=0.2312, Qy=0.2278